

many universities. In its place there occur crossed monologues, in which the parties use the same verbal devices either without realising their ambiguity or, if they do recognise it, without possessing any technique for coping with it.³ Because verbal devices merely indicate the region of an argument and only become terms, when they have been inserted within a theoretical structure, the conduct of any fruitful dialogue demands that all the parties to a discussion remain aware that arguments can be established in many ways, each of which generates its own kind of meaning. Secondly, they must also accept different ways of interpreting any fact in somewhat the same way as the members of the United Nations keep to their working rules (if not to the prescriptions of their Charter), while accepting the basic ideological divergence of the other members and, therefore, the fundamentally different conceptions of what happens in the world.

Many discussions about reform in the universities ignore the history of education in Europe—to say nothing of China and India. Moreover, specialists tend to say that most of what is worthwhile in their discipline has been discovered within the last 50 years.

If history gives narrative unity to the facts, then men have written different kinds of history about education and use different species of fact as the stuff of history. Hence, educational reformists must resolve the existence of many accounts of what has happened by using the art of dialectic. Traditionally, dialectic aimed at holding in play a number of irreducible approaches to experience and to argument in order to draw out the richness and complexity of the problems it posed. Now, this art has been debased to controversy and limited to politics.

The absence of historical and dialectical awareness from the educational debate has rendered the universities political in a way that the student revolutionaries (who have tried to deal with the internal problems of their institutions in addition to their relations with other public corporations) have seen clearly.⁴ But few of those planning curricula show that they are conscious of the richness of the intellectual tradition. Nor do they introduce it creatively into the debate and into the design of new educational systems. Hence, the discussion never becomes dialogue, but breaks down and is replaced by academic dogmatism. Education takes on a monolithic character, not because goodwill is lacking, but because the members of the modern universities often lack that sense of the past that is necessary to recognise what is truly new and the interpretative and critical skills to make them truly operative in creating the new kind of education which an evolving society demands.

NOTES

¹ The word *verbal device* renders the Greek word *topos* and the Latin word *locus*, as they were used by rhetoricians and philosophers. Another translation would be *topic* or *place*. The ancients distinguished between devices or topics and terms. The former were vague, while the latter had a precise meaning given them by argument. For example, "Every systematic treatment of argumentation has two branches, one concerned with invention of arguments and the other with judgment of their validity; Aristotle was the founder of both in my opinion. The Stoics have worked in only one of the two fields. That is to say, they have followed diligently the ways of judgment by means of the science which they call . . . dialectic, but they have totally neglected the art which is called . . . topics, an art which is both more useful and certainly prior in the order of nature. For my part, I shall begin with the earlier, since both are useful in the highest degree, and I intend to follow up both, if I have the leisure. A comparison may help: It is easy to find things that are hidden if the hiding place is pointed out and marked; similarly, if we wish to track down some argument we ought to know the places or topics: for that is the name given by Aristotle to the "regions", as it were, from which arguments are drawn. Accordingly, we may define a topic as the region of an argument, and an argument as a course of reasoning which firmly establishes a matter about which there is some doubt." Cicero, *Topics*, II, 6-8.

² Cf. A. Ruhan, "Educating for the Professions", *The Australian Journal of Higher Education*, 1970, Vol. 4 (No. 1), pp. 49-56.

³ Cf. R. P. McKeon, *Freedom and History: the Semantics of Philosophical Controversies and Ideological Conflicts*, Noonday Press, New York, 1952.

⁴ Cf. *Crisis at Columbia*, the Cox Commission Report on the disturbances at Columbia University in April and May 1968, Vintage, New York, pp. 19-24. Cf. also the thoughtful analysis of Joseph J. Schwab, *College Curriculum and Student Protest*, University of Chicago Press, Chicago, 1969, Chapter 1, "Diagnoses", and Chapter 2, "Curricular Resources", and Chapter 4, "Curricular Prescriptions".

ACADEMIC LIBRARIES AND INTERDISCIPLINARY STUDIES—PROBLEMS WITHOUT SOLUTION

LA TROBE UNIVERSITY LIBRARY STAFF PAPER

THE current urge for interdisciplinary studies presents some problems for academic libraries which can be categorised under three headings: intellectual, administrative and financial. Though these three categories are not entirely unrelated it is important to keep them separate when discussing bibliographic services in relation to interdisciplinary studies.

It may be trite to restate that territorial claims in intellectual matters tend to become unrealistic in face of the continuous expansion of the boundaries of knowledge; yet it is all too often still firmly believed that a large number of academic subjects are hedged in by impenetrable borders. The many attempts at the classification of knowledge as represented in printed documents have to some considerable degree contributed to the belief that academic disciplines are, if not exactly self-sufficient, then at least largely autonomous and sacrosanct within their boundaries. The older types of library classification reflect this belief fairly strongly, but schemes developed in the 20th century have taken more notice of the overlapping and interdependence of many fields of academic

study. One need only compare the two classification schemes of Melvil Dewey and of Henry Bliss to see the dangers which are inherent in the old fashioned and sadly dated divisions of learning in one, and the benefits flowing from the more modern spirit of accommodation and flexibility in the other. It is obvious, of course, that a structure formulated in the 1870s must be out of date in the 1970s, and it is not an unwarranted prediction that the fundamental pattern of the Bliss classification may well be out of date in the year 2040.

But the point at issue is: to what extent is it worth classifying books in a library when the boundaries between disciplines fluctuate, when new disciplines develop or are invented (and these two processes are not necessarily identical) overnight, and when the study of history moves more and more into the study of sociology and when genetics becomes largely mathematicised?

Doubts as to the value of the subject arrangement of books in libraries have a long and respectable history. The classic marshalling of arguments was done by Grace O. Kelley in 1937.¹ Two of her basic objections are directly relevant to the question of interdisciplinary studies. These are that the continuous development of knowledge makes impossible the static perfection of any classification system, and that the linear arrangement of books on shelves cannot reveal the complex relationships that exist between subject fields. Thus, the basic problem is not the structure of any individual classification scheme, or the way that it is applied in a particular library, but the very nature of shelf classification itself.

Shelf classification performs several roles. Much of the time it simply acts as an identification and location device. These functions could easily be fulfilled in other ways at least as effective and certainly simpler. More importantly, it serves as a visual display of the subject matter of the books in a library. It is this role which is suspect, and it is not therefore surprising that most of the research and development in the subject approach to library materials has concentrated on the arrangement and manipulation of surrogates for the items, in the form of entries in a manual or machine readable file, rather than the items themselves.

Most libraries already provide a tool of this kind as a subject guide to their collections, typically in the form of an alphabetical subject catalogue. Unfortunately, this catalogue, which is completely flexible, which takes no heed of the boundaries between disciplines, which is able to display the most complex subject relationships, and which can be used to index to any depth that policy demands,

is the least used and least understood element of the library record system. The development of interdisciplinary studies makes it imperative that the subject catalogue be raised to its proper place as the subject access point to library materials.

The only valid justification for shelf classification is the convenience of the users of the library. Browsing, "getting the feel" of the library's collection (or at least part of it) is held to have considerable educational value and is encouraged by the teaching staff in every modern university. We must assume that whatever the failings of our attempts to arrange books under subject collocations, the needs of some of the users are met at least some of the time. Even though librarians are more aware than most others that every book can be given one place only on the shelves, it is always hoped that the chosen location reflects most accurately the interest of the library users. It is this pattern of the use of libraries which justifies the continuation of subject shelf classification, at least for the time being.

The introduction of interdisciplinary courses and studies has caused administrative and financial problems in Australian universities attributable to national policies and academic attitudes which are no less unrealistic in their application to modern requirements than the traditional shelf classification mentioned above. As long as tertiary institutions in Australia are funded on the rather unimaginative basis of X dollars per e.f.t.s., interdisciplinary studies, however legitimate, will have a hard time surviving financially in a budgetary climate where staffing is largely dependent on the number of students a department can attract. This affects the smaller and new universities much more severely and adversely than is the case in the older institutions.

Unavoidably, the provision of library materials is likewise adversely affected when the university's financial resources are geared to traditional, "monotheistic" fields of study. In many universities it is still the practice to divide most of the total library vote according to some formula, to ensure that each teaching department or discipline has a fair chance of developing its bibliographic resources; even if there is a relatively large amount left to be used "at the discretion of the university librarian" this is rarely enough to allow for substantial interdisciplinary acquisitions. But even when there is no official division of the acquisition vote, the university librarian usually finds it incumbent upon him to allow most of these funds to be spent "in the interests of established disciplines". Fortunately it is not a widespread practice to have the university librarian swear that every item selected by him and

¹ Kelley, Grace O. *The classification of books*. New York, Wilson, 1937.

his staff fits neatly into any of the account slots dictated by committees or the exigencies of poverty—and, since time immemorial, librarians have surely reserved to themselves a fairly generous margin of latitude in the interpretation of library vote allocations.

From the point of view of library administration, any deviation from the hallowed principle of closely guarded department or discipline based allocations is in every respect a blessing. Such a rigid division of the book vote imposes severe restrictions on purchasing itself. It makes it extremely difficult to develop and implement a purchasing programme for the university as a whole, quite apart from encouraging the worst of all possible reasons for the purchase of any item—the need to spend money by a certain date, otherwise known as the P.S.S.S. (Public Service Spending Syndrome).

It is probably wise that some notional allocation be retained. Whether this is to be at faculty or departmental level is a decision which must be made in the light of different circumstances from university to university. Wherever possible the measuring stick to be used should be planned growth in volumes or titles, not expenditure in terms of dollars. It must be accepted from the start that the essence of such allocations is flexibility.

What is even more important is that such allocations must necessarily lose their overriding importance with the introduction of formalised interdisciplinary studies. Here the library must exercise a co-ordinating advisory role, which involves the selection of material on a broad spectrum by qualified staff. This role cannot be properly fulfilled unless there is a well defined library acquisition programme, properly and realistically funded, which matches the interdisciplinary programme.

Expenditure on interdisciplinary studies must be a responsibility shared by the library and teaching staff. The haphazard nature of book selection, if this is left largely to academics, cannot be passed over in silence. It is almost unavoidably intermittent and unsystematic. It more often than not ignores all but a small and specialised segment of a general field, and scant attention is paid to retrospective material, largely because book dealers' catalogues do not reach a scholar directly, but are usually first sent to the library; the time lapse which ensues frequently means that desiderata have been sold to other clients. Furthermore, selection tends to be unequally distributed within a department, for a number of quite valid reasons, apart from the natural enthusiasm of some members, and such work, which requires time and concentration, competes often unsuccessfully with other more immediate duties. The position

has been well discussed in the Parry Report on Libraries,² where the complementary, rather than supplementary, role of the library in book acquisition is discussed.

Librarians are fortunate if they can claim specialist knowledge in more than one field, apart from their chosen profession. Yet those concerned with acquisitions attain a general awareness of what is being published, and what is required by departments. Their continual contact with a flood of book lists, circulars, reviews, bibliographies and specialised journals provides them with a constant source of both reliable information and critical specialist assessment which is not easily available to others. These factors and their knowledge of the collection, the patterns which have emerged in the past and the new emphases it is receiving are surely an asset which should not remain untapped. This professional expertise is particularly valuable in the case of interdisciplinary studies, where that grey area between various more precisely defined fields is in danger of remaining unattended by academics who all too often "leave it to the other fellow". The existence of reprint projects of historical, economic and sociological value may be known to the librarian long before the scholar hears of these undertakings second or third hand, or sees them in another library!

The creation of "institutes" as a distinctive pool of research and teaching personnel in an interdisciplinary field should not affect the main library's central responsibility for the purchasing of all material. It is a needless waste of time and an inefficient duplication of effort and personnel to do otherwise. While European universities can indulge in such refinements as maintaining a small, inadequate and poorly organised library collection in a "Geographisches Institut des Süd-Asien Instituts" besides supporting a sizeable library in a fully fledged Geography Department on the same campus—not to mention substantial holdings in the central library—Australian research workers have usually only the main library to look to for their specialist needs. Yet the head of the Institut referred to confided that if his university had library services as they exist in most Australian universities, he would willingly surrender his collection to the central university library. He would also do this because the increasing ramifications of his area of research with other subject fields makes it desirable to have a more broadly based (or differently oriented) library collection, which he cannot afford to acquire with the limited (and decreasing) funds at his disposal. Interdisciplinary interests tend,

² Great Britain University Grants Committee, *Committee on Libraries Report*. London, H.M.S.O., 1967. (Chairman: Thomas Parry.) Chapter V.

therefore, to favour the concentration of the university's bibliographic resources in one centrally organised repository.

The concept of interdisciplinary studies is not especially new. Since the revival of learning in the 15th and 16th centuries, classical studies have been an interdisciplinary field par excellence, and the old arguments over the place of mathematics in the hierarchy of knowledge will reflect the pervasiveness of that subject and, by implication, its interdisciplinary character. Indeed, the concept should hold great appeal for a librarian, whose attitudes will be normally geared to as broad-fronted an approach as possible. It is the acquisition and organisation of material which will provide the greatest cause for challenge and the most urgent need for co-operation.

IS A SCIENCE OF INFORMATION POSSIBLE?

CARMEL MAGUIRE*

IF a science needed only local habitation and name as credentials, information science would be well established. Many universities and colleges house schools of information science, but on closer inspection they often turn out to be schools of computing science or rather less often schools of librarianship. The field of computing science is interdisciplinary in that it combines the methodologies of engineering in the creation and study of computer hardware and of mathematics and logic in the creation and study of computer software. Yet to equate computer science with information science hardly does justice to the subtlety and variety of factors involved in the creation, processing and transfer of information. Robert Hayes points out that "Because computer science has become formalised at the same time as information science and because the computer is the most clear-cut example of an information system, it has been natural to identify information science with computer science".¹ But Hayes is also anxious to make clear that "Although mechanisation has provided the catalyst and has made information science of immediate value and importance, the problems are present in any system, whether mechanised or not".²

To librarians information science offers what their field has lacked too long, a theoretical basis. It is no accident that librarians have remained bound to their institutions in fact as in name, whereas doctors have never been hospitalarians and have long since ceased to operate in barbers' shops. There is no doubt that many

of the research findings in psychology, linguistics and sociology, for example, are relevant to the design and operation of bibliographical and document delivery services which seek to make accessible whatever portion of recorded knowledge is required. Whether the information sought is recorded on paper, film or magnetic tape has little bearing on whether its presence is indicated in such a way as to permit its retrieval when needed, or indeed on whether the seeker will approach the most likely source for information. Yet when schools of librarianship become schools of information science what usually happens is not the opening up of a new area of interdisciplinary studies but the addition to the curriculum of well- or ill-assorted courses in systems analysis, computer programming and text handling, and in mechanised information retrieval.

In some schools information science is used as a synonym for the study of information transfer among scientists. The development of this concept of information science has no doubt been influenced by the fact that the pioneer work in the study of information users, or in what might be termed the sociology of science information, was done for scientists and largely by scientists like J. D. Bernal and Derek De Solla Price. Moreover, although engineers have had some attention, studies of the users of information have been much more numerous among research workers in the physical and biological sciences than in other disciplines.

Information science may be regarded as evidence of the truth of Piaget's assertion that "In general it is repeatedly stated that the future lies in interdisciplinary research, but in fact this is often very difficult to organise because of mutual and sometimes deep-rooted ignorance".³ To take what is probably the most complete definition of information science attempted is to realise how much ignorance the representative of any one speciality who comes to consider the field is likely to command.

Information science is that discipline that investigates the properties and behaviour of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. It is concerned with that body of knowledge relating to the origination, collection, organisation, storage, retrieval, interpretation, transmission, transformation and utilisation of information. This includes the investigation of information representations in both natural and artificial systems, the use of codes for efficient message transmission, and the study of information processing devices and techniques such as computers and their programming systems. It is an interdisciplinary science derived

* Lecturer in Librarianship, University of New South Wales.